



a. I calculated the bubble point pressures for two different hydrocarbon mixtures using the NIST Standard Reference Database 4, Thermophysical Properties of Hydrocarbon Mixtures Database (SUPERTRAPP), Version 2.01.

b. Hydrocarbon Mixture A was a kerosine surrogate composition that consisted of the following blend of hydrocarbons:

| <b>Component -<br/>Hydrocarbon Mixture A</b> | <b>Wt%</b> |
|--|------------|
| isooctane                                    | 5          |
| methylcyclohexane                            | 5          |
| <i>m</i> -xylene                             | 5          |
| 1,1,2-trimethylcyclohexane                   | 5          |
| decane                                       | 15         |
| butylbenzene                                 | 5          |
| 1,2,4,5-tetramethylbenzene                   | 5          |
| <i>cis</i> -decalin                          | 5          |
| dodecane                                     | 20         |
| 1-methylnaphthalene                          | 5          |
| tetradecane                                  | 15         |
| hexadecane                                   | 10         |

c. Hydrocarbon Mixture B was a hydrocarbon blend that consisted of the following blend of hydrocarbons:

| <b>Component -<br/>Hydrocarbon Mixture B</b> | <b>Wt%</b> |
|--|------------|
| heptane                                      | 25         |
| octane                                       | 25         |
| nonane                                       | 25         |
| decane                                       | 25         |

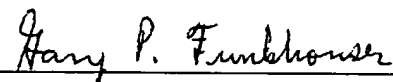
d. I calculated the bubble point pressures for these hydrocarbon mixtures at five different temperatures (100°C, 120°C, 130°C, 140°C, and 150°C).

3. The bubble point pressures that I calculated according to the above procedure are given below:

| Temp., °C | Bubble point pressures (psi) |                       |
|-----------|------------------------------|-----------------------|
|           | Hydrocarbon Mixture A        | Hydrocarbon Mixture B |
| 100       | 2.8                          | 7.1                   |
| 120       | 5.1                          | 12.8                  |
| 130       | 6.5                          | 16.5                  |
| 140       | 8.1                          | 21.3                  |
| 150       | 10.9                         | 27.1                  |

4. In my opinion, these bubble point pressures indicate that the hydrocarbon blends with compositions similar to those of Hydrocarbon Mixture A will be less volatile than those similar to Hydrocarbon Mixture B.

5. I hereby declare that all statements made herein of my own knowledge are true and that all statements made herein on information and belief are believed to be true. I declare that these statements are made with the knowledge that willful false statements, and the like so made, are punishable by fine or imprisonment, or both, under Section 1001, Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

  
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